

WHAT IS CLAIMED IS:

1. A method for fabricating a semiconductor device comprising the steps of:

forming a semiconductor film over a semiconductor substrate;

implanting a dopant into a prescribed region of the semiconductor film; and

patterning the semiconductor film to form a resistance element of the semiconductor film with the dopant implanted, and a gate electrode of the semiconductor film with the dopant not implanted.

2. A method for fabricating a semiconductor device according to claim 1, further comprising, after the step of forming a gate electrode, the step of implanting a dopant into the gate electrode.

3. A method for fabricating a semiconductor device according to claim 2, wherein

in the step of implanting the dopant into the gate electrode, the dopant is implanted into the semiconductor substrate on both sides of the gate electrode to form a dopant diffused region.

4. A method for fabricating a semiconductor device according to claim 2, wherein

in the step of forming the gate electrode, a first gate electrode and a second gate electrode are formed, and

in the step of implanting the dopant into the gate electrode, a first conduction type dopant is implanted into the first gate electrode, and a second conduction type dopant is implanted into the second gate electrode.

5. A method for fabricating a semiconductor device according to claim 3, wherein

in the step of forming the gate electrode, a first gate electrode and a second gate electrode are formed, and

in the step of implanting the dopant into the gate electrode, a first conduction type dopant is implanted into the first gate electrode, and a second conduction type dopant is implanted into the second gate electrode.

6. A method for fabricating a semiconductor device according to claim 1, wherein

in the step of implanting the dopant into the semiconductor film, the dopant is implanted into a plurality of regions of the prescribed region in concentrations different from each other to form a plurality of the resistance elements of resistance values different from each other.

7. A method for fabricating a semiconductor device according to claim 2, wherein

in the step of implanting the dopant into the semiconductor film, the dopant is implanted into a plurality of regions of the prescribed region in

concentrations different from each other to form a plurality of the resistance elements of resistance values different from each other.

8. A method for fabricating a semiconductor device according to claim 3, wherein

in the step of implanting the dopant into the semiconductor film, the dopant is implanted into a plurality of regions of the prescribed region in concentrations different from each other to form a plurality of the resistance elements of resistance values different from each other.

9. A method for fabricating a semiconductor device according to claim 1, further comprising, after the step of forming the gate electrode, the steps of:

forming an insulation film for covering the gate electrode and the resistance element; and

etching the insulation film to leave the insulation film on the resistance element and form a sidewall insulation film on the side wall of the gate electrode.

10. A method for fabricating a semiconductor device according to claim 2, further comprising, after the step of forming the gate electrode, the steps of:

forming an insulation film for covering the gate electrode and the resistance element; and

etching the insulation film to leave the insulation film on the resistance element and form a sidewall

insulation film on the side wall of the gate electrode.

11. A method for fabricating a semiconductor device according to claim 3, further comprising, after the step of forming the gate electrode, the steps of:

forming an insulation film for covering the gate electrode and the resistance element; and

etching the insulation film to leave the insulation film on the resistance element and form a sidewall insulation film on the side wall of the gate electrode.

12. A method for fabricating a semiconductor device according to claim 9, further comprising, after the step of forming the sidewall insulation film, the step of forming a metal film on the semiconductor substrate with the gate electrode formed on, performing thermal processing to silicide the metal film to thereby form a silicide film on the gate electrode and the semiconductor substrate on both sides of the gate electrode.

13. A method for fabricating a semiconductor device according to claim 10, further comprising, after the step of forming the sidewall insulation film, the step of forming a metal film on the semiconductor substrate with the gate electrode formed on, performing thermal processing to silicide the metal film to thereby form a silicide film on the gate electrode and the semiconductor substrate on both sides of the gate electrode.

14. A method for fabricating a semiconductor device

according to claim 1, wherein

in the step of implanting the dopant into the semiconductor film, the dopant is ion implanted at a $1 \times 10^{15} \text{ cm}^{-2}$ dose or above.

15. A method for fabricating a semiconductor device according to claim 2, wherein

in the step of implanting the dopant into the semiconductor film, the dopant is ion implanted at a $1 \times 10^{15} \text{ cm}^{-2}$ dose or above.

16. A method for fabricating a semiconductor device according to claim 3, wherein

in the step of implanting the dopant into the semiconductor film, the dopant is ion implanted at a $1 \times 10^{15} \text{ cm}^{-2}$ dose or above.

17. A method for fabricating a semiconductor device according to claim 1, wherein

in the step of forming the semiconductor film, the semiconductor film is formed of polysilicon or amorphous silicon.

18. A method for fabricating a semiconductor device according to claim 2, wherein

in the step of forming the semiconductor film, the semiconductor film is formed of polysilicon or amorphous silicon.

19. A method for fabricating a semiconductor device according to claim 3, wherein

in the step of forming the semiconductor film, the semiconductor film is formed of polysilicon or amorphous silicon.